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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/573,468	12/01/2006	Hiroya Kobayashi	46884-5467	9268
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DRINKER BIDDLE & REATH (DC) 1500 K STREET, N.W. SUITE 1100 WASHINGTON, DC 20005-1209			DOAN, THERESA T	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/573,468	<b>Applicant(s)</b> KOBAYASHI ET AL.
	<b>Examiner</b> Theresa T. Doan	<b>Art Unit</b> 2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If no period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 23 September 2008.

2a) This action is FINAL.      2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-5 is/are pending in the application.

4a) Of the above claim(s) 3-5 is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 1 and 2 is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 24 March 2006 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All    b) Some \* c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 100708, 092308, 082608, 071508, 020108, 120106

4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_

5) Notice of Informal Patent Application

6) Other: \_\_\_\_\_



**DETAILED ACTION**

***Election/Restrictions***

1. Applicant's election with traverse of claims 1-2 in the reply filed on 09/23/08 is acknowledged. The traversal is on the ground(s) that Species I is related to Figs. 1-3 showing that the wiring substrate is subject to wettability property processing and Species II (claims 3-5) is related to Figs. 4-8 showing protrusions. Applicants note that the end portion of paragraph [0050] of the specification of the instant application states that "[t]hat is, it can be said that protrusions 27 are formed as a wettability processing on wiring substrate...". This is not found persuasive because as noted in MPEP § 806.04(f) that: "claims to be restricted to different species must be mutually exclusive. The general test as to when claims are restricted, respectively, to different species is the fact that one claim recites limitations which under the disclosure are found in a first species but not in a second, while a second claim recites limitations disclosed only for the second species and not the first." In this case, clearly, the elected claims recite that a semiconductor device having the wiring substrate is subject to a wettability property processing, by which a first region that surrounds a region opposing the thinned portion and second regions that extend outward from the first region are lowered in wettability with respect to the resin (claim 1). These recited limitations are found in an elected species claims but not in the non-elected species claims. Moreover, the search is not coextensive as evidenced by different search for different species. Therefore, the search and examination of the entire application would place a serious burden on the

examiner. Accordingly, claims 3-5 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

The requirement is still deemed proper and is therefore made FINAL.

***Drawings***

2. Figure 12 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Schwarzrock et al. (6,605,828).

Schwarzrock (Fig. 1) discloses a semiconductor device comprising:

a semiconductor substrate 100, having a photodetecting unit 11 formed on one surface, a thinned portion formed by etching a region, opposing the photodetecting unit, of another surface, and first electrodes 101 disposed on the one surface at an outer edge of the thinned portion and electrically connected to the photodetecting unit 11;

a wiring substrate 16, disposed to oppose the one surface side of the semiconductor substrate 100 and having second electrodes 17/171 connected via conductive bumps 18 to the first electrodes 101; and

a resin 20, filling a gap between the wiring substrate 16 and the outer edge of the thinned portion to reinforce the strength of bonding of the respective first electrodes and the respective second electrodes with the conductive bumps;

wherein the wiring substrate is subject to a wettability property processing (column 4, lines 46-52), by which a first region that surrounds a region opposing the thinned portion and second regions that extend outward from the first region are lowered in wettability with respect to the resin, and

the resin 20 surrounds the periphery of the gap between the thinned portion and the wiring substrate except at the second regions that are portions of the periphery.

It is noted that the process limitations (etching, wettability property processing) would not carry patentable weight in this claim drawn to a structure, because distinct structure is not necessarily produced. In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schwarzrock et al. (6,605,828) in view of Hara et al. (6,828,657).

Schwarzrock discloses all the claimed limitations as discussed above except for the wettability processing, a silicone resin, a polytetrafluoroethylene, or a wax is coated onto the first region and the second regions of the wiring substrate.

However, Hara discloses an organic material with a low wettability such as silicon resin in order to obtain a low wettability (column 6, lines 15-20). It has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of design choice. *In re Leshin*, 125 USPQ 416. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the method of Schwarzrock by forming the silicon resin for the wettability processing in order to obtain a low wettability, as taught by Hara (column 6, lines 15-20).

***Double Patenting***

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent

and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 1-2 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3 of copending Application No. 10/573,467 (U.S. Pub. 2007/0272997 in view of Schwarzrock et al. (6,605,828).

Although the conflicting claims are not identical, they are not patentably distinct from each other because both applications claimed a semiconductor device comprising: a semiconductor substrate, having a photodetecting unit formed on one surface, a thinned portion formed by etching a region, opposing the photodetecting unit. Specifically, regarding claim 1 of instant application, claim 1 of copending application discloses a semiconductor device comprising:

a semiconductor substrate, having a photodetecting unit formed on one surface, a thinned portion formed by etching a region, opposing the photodetecting unit, of another surface, and first electrodes disposed on the one surface at an outer edge of the thinned portion and electrically connected to the photodetecting unit (claim 1, lines 1-7);

a wiring substrate, disposed to oppose the one surface side of the semiconductor substrate and having second electrodes connected via conductive bumps to the first electrodes (claim 1, lines 8-11); and

a resin, filling a gap between the wiring substrate and the outer edge of the thinned portion to reinforce the strength of bonding of the respective first electrodes and the respective second electrodes with the conductive bumps (claim 1, lines 12-16); and

the resin surrounds the periphery of the gap between the thinned portion and the wiring substrate except at the second regions that are portions of the periphery (claim 1, lines 17-20).

The copending Application No. 10/573,467 (U.S. Pub. 2007/0272997) does not claim wherein the wiring substrate is subject to a wettability property processing, by which a first region that surrounds a region opposing the thinned portion and second regions that extend outward from the first region are lowered in wettability with respect to the resin.

However, Schwarzock (Fig. 1) discloses wherein the wiring substrate is subject to a wettability property processing, by which a first region that surrounds a region opposing the thinned portion and second regions that extend outward from the first region are lowered in wettability with respect to the resin (column 4, lines 46-52).

Accordingly, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the method of Schwarzock by forming the wiring substrate is subject to a wettability property processing as set forth above, because such using the wettability property processing would depend on the processing

environment with the product made and technology used, as taught by Schwarzock (column 4, lines 46-52).

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented. The facts are that the claims of the instant application and the copending application have claimed the same goal.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Theresa T. Doan whose telephone number is (571) 272-1704. The examiner can normally be reached on Monday, Tuesday and Thursday from 7:00AM - 3:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, WAEL FAHMY can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Theresa T. Doan/  
Primary Examiner, Art Unit 2814